

**Notice of Allowability**

Application No.

10/737,227

Examiner

Khanh B. Duong

Applicant(s)

JEONG ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the election filed 28 July 2005.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☒ The drawings filed on 16 December 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date 12/16/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

Michael Trinh  
Primary Examiner  
Act SPE

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of Species I (claims 1-7) in the reply filed on July 28, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Upon further consideration, Species II (claims 8-20) is determined to be patentably similar to the elected Species I. Thus, claims 8-20, directed to the process of manufacturing a CMOS image sensor using a negative photoresist to form an OCL, previously withdrawn from consideration as a result of a restriction requirement, are now subject to being rejoined. Claims 8-20 are hereby rejoined and fully examined for patentability under 37 CFR 1.104.

Claims 21-32 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim.

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

## **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In the Claims:

Please cancel claims 21-32.

*Allowable Subject Matter*

Claims 1-20 are allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art of record, taken alone or in combination, fairly shows or suggests all the process limitations as claimed.

Re claim 1, none of the prior art of record discloses a method for manufacturing a CMOS image sensor comprising the following steps in combination with other steps as claimed: d) forming an over-coating layer (OCL) on the color filter array by using a positive photoresist; e) forming openings in the OCL by patterning the OCL by using a binary mask, wherein the binary mask has coated portions and uncoated portions, the uncoated portions being disposed above boundaries between the color filters; and f) forming dome-typed microlenses on a patterned OCL.

Re claim 8, none of the prior art of record discloses a method for manufacturing a CMOS image sensor comprising the following steps in combination with other steps as claimed: d) forming an OCL on the color filter array by using a negative photoresist; e) forming openings in the OCL by patterning the OCL by using a binary mask, wherein the binary mask has coated portions and uncoated portions, the coated portions being disposed above boundaries between the color filters; and f) forming dome-typed microlenses on a patterned OCL.

Re claim 15, none of the prior art of record discloses a method for manufacturing a CMOS image sensor comprising the following steps in combination with other steps as claimed:

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d) forming an OCL on the color filter array by using a negative photoresist; e) forming openings in the OCL by patterning the OCL by using a phase shifted mask (PSM), wherein the PSM has a  $0^{\circ}$  phase and a  $180^{\circ}$  phase, boundaries between the  $0^{\circ}$  phase and the  $180^{\circ}$  phase being disposed above boundaries between the color filters; and forming dome-typed microlenses on a patterned OCL.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references disclose relevant teachings regarding processes of forming image sensors: Yamamoto '934, Murakami '668, Fukuyoshi '442, Chang '266 and Murade 778. However, none of these references, taken alone or in combination, fairly shows or suggests all the limitations as claimed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on 10:00-6:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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